

## **2016 Ulu Project Geotechnical Inspection**

Submitted to:  
**Bonito Capital Corp.**

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C O R P O R A T I O N

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## **1 INTRODUCTION**

The Ulu Gold Project (Ulu) is an advanced exploration project that is currently in care and maintenance status, covered under Nunavut Water License 2BM-ULU1520 issued to Bonito Capital Corporation (Bonito), a wholly owned subsidiary of Mandalay Resources Corporation. The project is situated in Kitikmeot tundra region of Nunavut about 150 km north of the Lupin Mine. The project site is an underground exploration site with an airstrip, camp and supporting facilities. The surrounding landscape is dominated by treeless arctic tundra with exposed weathered bedrock and glacial features. Figure 1 shows the general location of Ulu Gold Project.

### **1.1 Scope of Work**

Bonito has retained Norwest Corporation (Norwest) to conduct the 2016 geotechnical site inspection in fulfillment of the water license requirements, where Part D.10 specifies:

*“An inspection of the earthworks, geological regime, and the hydrological regime of the Project is to be carried out by a Geotechnical Engineer prior to the recommencement of on-site activities and annually thereafter. The Geotechnical Engineer’s report shall be submitted to the Board within sixty (60) days of the inspection, with a covering letter from the Licensee outlining an implementation plan to respond to the Engineer’s recommendations.”*

The scope of work was to carry out geotechnical inspections of the following structures:

- Ulu Gold Project Main Tank Farm containment berm.
- Day fuel tank containment berm.
- Camp 3 fuel tank farm containment berm.
- Mine sump.
- Waste rock storage pad.
- Portal Laydown pad.

This report summarizes Norwest’s observations made during the 2016 site inspection and provides recommendations for remediation as necessary. The report does not include any commentary on fuel storage, waste or water management practices.

## **2 SITE CONDITIONS**

### **2.1 Site History**

Echo Bay Mines Ltd. (EBM) purchased the Ulu Gold Project site lease from BHP Minerals in 1995. Underground development was started in 1996 with the exploration mining work suspended in 1997. Kinross Gold Corporation acquired EBM through a merger in January 2003, followed up by Wolfden Resources Inc. purchasing the site in December 2003. Wolfden reopened the underground exploration work in 2005 but it was suspended due to safety concerns. The mine returned to care and maintenance in 2006.

Zinifex Canada Inc. purchased Wolfden in October 2007 and took over Ulu amongst other assets. Zinifex merged with Oxiana Ltd. to form OZ minerals in June 2008, which was purchased by China Minmetals to become MMG Resources Inc. In July 2011 Bonito, a wholly owned indirect subsidiary of Elgin Mining Inc., purchased the site from MMG. Mandalay Resources Corporation purchased Elgin Mining Inc. in 2014. Annual geotechnical inspections were completed by BGC Engineering between 2007 and 2010, by TBT Engineering in 2011, and by SRK Consulting between 2012 and 2015.

### **2.2 Site Infrastructures**

Year-round access to the site is by aircraft only. The Ulu Gold Project consist of three major areas: Ulu Camp, airstrip, and Camp 3 (see Figure 2):

- The facilities at the Ulu Camp consist of a 60-person camp, a vehicle repair shop, powerhouse, warehouse, cold storage, and office. This site also houses a fuel tank farm, day use tank, fresh water and sewage systems, garbage incinerator, laydown pad, waste rock storage pad, mine portal, and explosive magazines. The fuel tank farm consists of five 53 thousand litre tanks containing fuel and day use tank is an 8 thousand litre tank currently stands empty. The ore was intended to be transported via an ice road during the winter months to the Lupin Mine for processing. No processing facility was constructed at Ulu.
- The airstrip is a 1.5 km compacted gravel structure with capability to land a Dash-8 type aircraft. The site does not have a full-time weather station for monitoring and record.
- The Camp 3 area has a fuel tank farm and a vehicle repair shop. The fuel tank farm consists of two 1.3 million litre tanks and six 53 thousand litre tanks, which are not in use and stands empty. Historically, the fuel tanks were used to store P40 and P50 grade fuels. To minimize risks, all the fuels were consolidated in their separate grade within the Ulu Camp tank farm.



### **2.3 Climate**

There is no weather station on site to actively record data. The nearest recording station is at Lupin Mine site about 150 km south. Generally, the area is characterized by high arctic climate with severe winter and cool summers. The extreme temperatures range from approximately -50°C in winter to 25°C in summer. Permafrost is found in and around the site and typically extends to several hundred metres (NWB 2009). The annual mean precipitation is assumed to be between 300-350mm, based on the information available at the Lupin Mine.

### **2.4 Site Geology**

The SRK Consulting 2015 Annual Inspection Report (SRK 2015) provided a summary of geology on the Ulu Gold Project and is summarized as follows:

*“The Ulu claim are located within the High Lakes Volcanic Belt of the Archean Slave Structural province. This geological province consists of basement gneisses overlaid by greywacke turbidite and basalt in thick sequences. The High Lake Volcanic Belt is part of such sequence and consist of a north-south trending volcanic and sedimentary sequence, enclosed by later Archean granitoid rocks.*

*The geology of the Ulu property consists of a sequence of folded mafic volcanic, mafic intrusive and sedimentary rocks, metamorphosed to upper greenschist/lower amphibolite phases. These rocks are intruded by later felsic intrusive rocks and diabase dykes. At least three phases of deformation are noted with the rocks at Ulu. The volcanic, intrusive, and sedimentary rocks are folded into a north trending anticline that plunges deeply to the north in the area of the Flood Zone. Gold occurs in laminated calc-silicate veins and in quartz veins. The high concentrations of gold grains are found in quartz veins containing fine-grained arsenopyrite. Gold mineralization occurs primarily in the basalt and to some degree in the sediments. Very little gold mineralization occurs in the gabbroic rocks.”*

### **3 GEOTECHNICAL INSPECTIONS**

#### **3.1 General**

Mr. Alvin Tong, P.Eng., a senior geotechnical engineer with Norwest, conducted the geotechnical inspection on 25<sup>th</sup> of August, 2016. A general aerial survey was done during air transit and a detailed visual inspection was done on foot. Mr. Dave Vokey, representing Bonito was present during the visit for communication and correspondence.

The weather condition at the inspection was overcast with sunny periods and high gusts of wind. A detailed photographic log of the inspection is included in Appendix A.

#### **3.2 Ulu Camp**

The Ulu camp area (Figure 3) consists of the following inspected facilities:

- Mine sump (Photo 21).
- Main Tank Farm Containment Berm.
- Day Fuel Tank Containment Berm.
- Waste Rock Storage Pad.
- Portal Laydown Pad.

All the facilities are generally in good condition with regard to stability. Of notable concern is minor damage within the geosynthetics and sand over liner erosions observed in the containment berms and sump.

The edges and the slopes of the geosynthetics liner at the mine sump were found to be exposed, where the protective over liner was sloughed off (Photo 7 and 8). Minor yielded deformations were found on the exposed liner. These deformations should be tested and repaired as necessary, and the over liner replaced for protection prior to utilization of the sump.

Similar over liner erosion and liner damage are found in the main tank farm and day use fuel containment, where liners are exposed with minor damage near the crest (Photo 12 to 17). The liner needs be patch up and tested as necessary, covered with protective over liner to prevent effluent leakage at extreme high water. Animal burrows were observed last year but were not observed this year. The ponding water left over in the containment berm suggests the liner at the bottom is still intact.

The waste rock storage pad (Photos 18 and 19) and portal laydown pad (Photos 9 to 11) were found to be in similar satisfactory geotechnical condition. No large deformations such as cracks, sloughs, settlements or erosions were found.

### **3.3 Camp 3**

The Camp 3 area consists of the following facilities:

- Camp 3 Fuel Tank Farm (Photo 1); and,
- Vehicle repair shop.

Similar over liner erosion and liner damage are found in the Ulu main tank farm containment, where liners are exposed with minor damages near upper slope and the crest. The damaged liner should be patched and tested, and the over liner should be replaced prior to refueling the tanks (Photos 4 and 5). In addition, the wooden cribbing underneath three of the fuel tanks is broken and causing the tanks to lean (Photos 2 and 3). It is recommended that the cribbing be replaced and the tank to be levelled. Alternatively, the tanks could be decommissioned and removed from the containment to eliminate the risk of falling over and damage other parts of the facility.

The vehicle repair shop was observed to have some structural damage but the foundation pad is in stable geotechnical condition (Photo 6). A structural engineer should inspect the structure as necessary prior to operation of the shop.

Although it is not a facility that requires official inspection, the road connecting Camp 3 to the airstrip was damaged by a number of large erosion gullies. These erosion gullies impede large vehicles, thus limiting access for equipment to complete the maintenance work at Camp 3. It is recommended that the road be repaired to allow regular vehicle access.

#### **4 RECOMMENDATIONS**

Overall, the facilities at the Ulu Gold Project are in good condition; Norwest recommends the following maintenance to minimize risks and repairs prior to commencement of exploration operations.

- Repair all damaged liner and test the repairs
- After the tests, cover all exposed liner and any exposed edges with protective over liner
- Replace the broken wooden cribbing in the Camp 3 fuel tank farm and re-level the tanks or decommission and remove the tanks from the containment.
- Continue to monitor the animal burrow activities on site.
- Repair the access roads between the camps for safe vehicle access.

## 5 CLOSURE

This report has been prepared by Norwest for Bonito Capital Corporation. The text contained herein presents documentation of the inspection carried out by Norwest with respect to the safe operation of the Ulu Gold Project, located in Nunavut, Canada. This report represents the opinion of Norwest based on information provided by Bonito and observations made during limited site visits.

All the information contained herein has been interpreted by Alvin Tong, P.Eng., and has been reviewed by Tim Peterson, P.Eng.

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Reviewed by:



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**Appendix A**  
**Photographic Logs**

Appendix A details

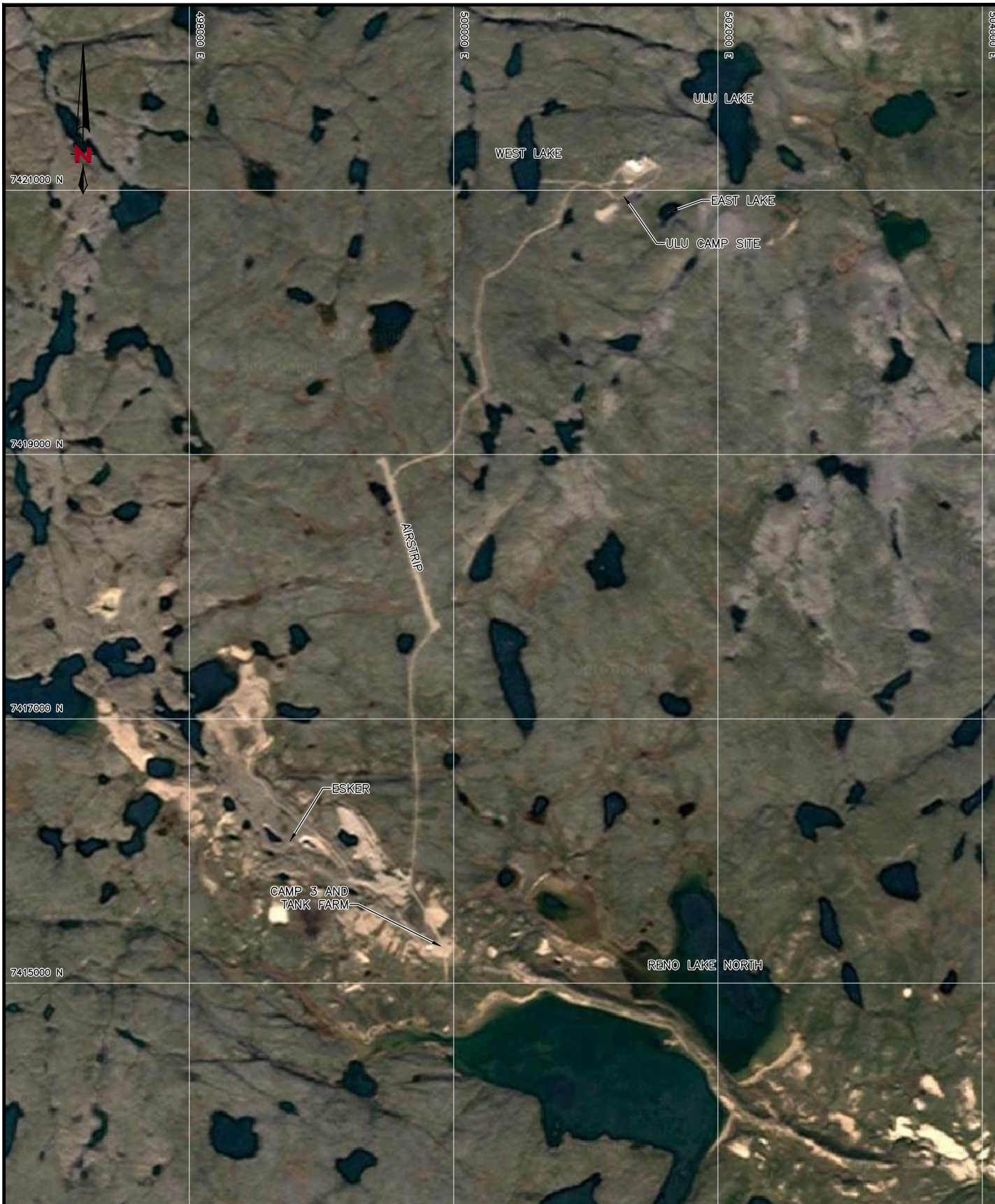
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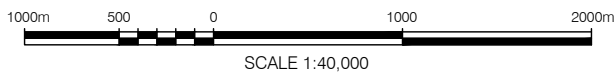
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BONITO CAPITAL CORP.										
ULU PROJECT										
SITE LOCATION										
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DATE:	2016-10-21									
CO-ORD. SYS.:	UTM-NAD83-12									
DRWN BY:	KM									
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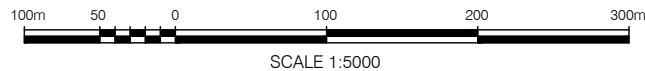
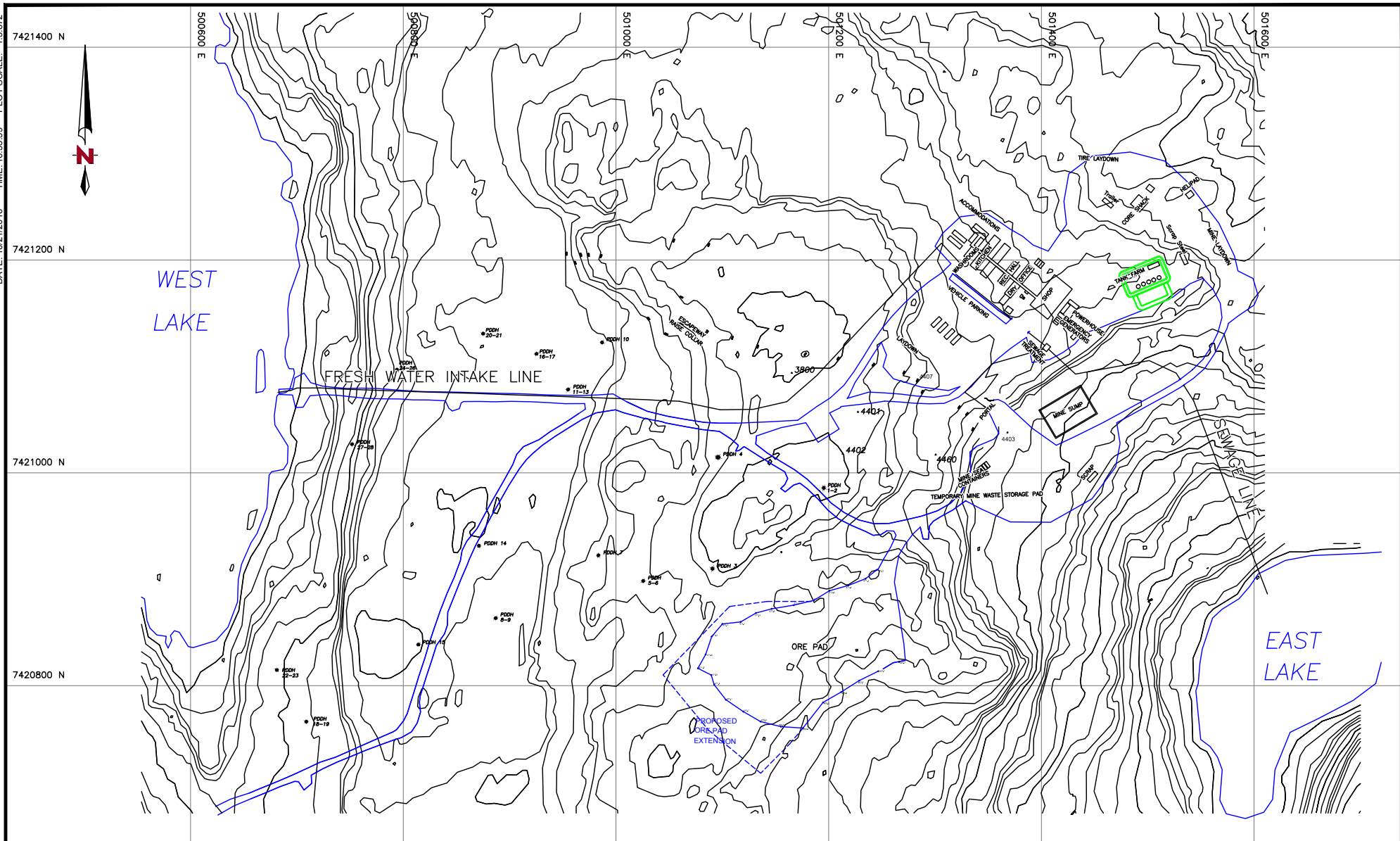
**NOTE:**

1. DRAWING SCALE AND LOCATIONS ARE APPROXIMATE BASED VISUALLY.



SCALES INDICATED BASED ON AN 8.5"x11" PLOT CONFIGURATION

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REV.	DATE	DESCRIPTION	DWN	DSG	CHK	APR
BONITO CAPITAL CORP.						
ULU PROJECT						
SCALE:	AS SHOWN	ULU FACILITY AREA PLAN				
DATE:	2016-10-21					
CO-ORD. SYS.:	UTM-NAD83-12					
DRWN BY:	KM					
DSGN BY:	--					
REV'D BY:	AT	NORWEST	PROJECT NO.:	FIG. NO.:	REV.:	
APP'D BY:	SE		948-1	2		



SCALES INDICATED BASED ON AN 8.5"x11" PLOT CONFIGURATION

REV#	Date	DESCRIPTION	XX	XX	XX	XX
REV.	DATE	DESCRIPTION	DWN	DSG	CHK	APR
<b>BONITO CAPITAL CORP.</b>						
<b>ULU PROJECT</b>						
<b>ULU SITE PLAN</b>						
SCALE:	AS SHOWN					
DATE:	2016-10-21					
CO-ORD. SYS.:	UTM-NAD83-12					
DRWN BY:	KM					
DSGN BY:	--					
REV'D BY:	AT					
APP'D BY:	SE					
<b>NORWEST</b>			PROJECT NO.:	948-1		FIG. NO.:
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Photo 1: Looking southeast at the Camp 3 fuel tank farm.



Photo 2: Looking southeast at one of the leaning 53 thousand litres tank.



Photo 3: At the broken wooden cribbing at the base of the leaning tank.



Photo 4: Looking at the exposed and damaged liner at the northeast corner of the tank farm.



Photo 5: Looking at the exposed and damaged liner at the southeast corner of the tank farm.



Photo 6: Looking west at the vehicle shop at Camp 3 area.

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	2016 Geotechnical Inspection		
Site Inspection Photograph Log at the Camp 3 area			
NORWEST	PN: 924-2	FIGURE 1	REV. A





Photo 7: Looking southwest at the exposed liner in the mine sump



Photo 8: Looking at the northern edge of the exposed liner in the mine sump.



Photo 9: Looking southwest at the leading edge of the portal laydown area.



Photo 10: Looking northeast at the leading edge of the portal laydown area.



Photo 11: Looking south at the panoramic view at the top of the portal laydown area.

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	2016 Geotechnical Inspection		
Site Inspection Photograph Log at the Ulu Camp			
NORWEST	PN: 924-2	FIGURE 2	REV. A





Photo 12: Looking northwest at the east side of the Ulu Main Tank Farm containment berm.



Photo 13: Looking at the south side of the containment berm. Note the high water mark.



Photo 14: Looking at the west side of the containment berm with the exposed liner.



Photo 15: Looking south into the main tank farm from the access ramp.



Photo 16: Looking northwest at the Ulu day use tank containment berm.



Photo 17: Looking at the exposed and damaged liner at the south side of the day use tank containment berm.

Bonito	Bonito Capital Corp.		
	2016 Geotechnical Inspection		
Site Inspection Photograph Log at the Ulu Camp			
NORWEST	PN: 924-2	FIGURE 3	REV. A





Photo 18: Looking southwest at the top of the waste rock storage pad.



Photo 19: Looking at the northeast corner of the waste rock storage pad.



Photo 20: Looking at one of the large erosion gullies across the access road between the airstrip and Camp 3.



Photo 21: Looking at the submerged bulkhead of the mine portal.

Bonito	Bonito Capital Corp.		
	2016 Geotechnical Inspection		
Site Inspection Photograph Log at the Ulu Camp and Access Road			
NORWEST	PN: 924-2	FIGURE 4	REV. A